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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/599,000	06/22/2000	Arlin R. Davis	1020.P7730	8544

57035 7590 04/14/2008

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EXAMINER	
MEW, KEVIN D	

ART UNIT	PAPER NUMBER
2616	

MAIL DATE	DELIVERY MODE
04/14/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/599,000	DAVIS, ARLIN R.	
	Examiner	Art Unit	
	Kevin Mew	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-10,12-14,17-23,25-29,31 and 33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-10,12-14, 17-23, 25-29, 31 and 33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Final Action

Response to Amendment

1. Applicant's Arguments/Remarks filed on 1/29/2008 regarding claims 1, 3-10, 12-14, 17-23, 25-29, 31, 33 have been considered. Claims 2, 11, 15-16, 24, 30, 32 have been cancelled by applicant. Claims 1, 3-10, 12-14, 17-23, 25-29, 31, 33 are currently pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-10, 12-13, 31, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forin et al. (USP 6,321,276) in view of Regnier et al. (US Publication 2002/0062402), and in further view of Munoz et al. (USP 6,741,585).

Regarding claim 1, Forin discloses an apparatus at a node (**personal computer**, see element 20, Fig. 1) in a network (**in a networked environment**, see Fig. 1) comprising:

a first work queue pair (**a first pair of send and receive queues in personal computer 20**, see col. 15, lines 37-43, elements 107, 108, Fig. 6) comprising descriptors to describe data to be transmitted (**comprising a descriptor to describe the virtual memory address of the buffer to be sent**, co. 15, lines 43-46) from a first node (**from a first personal computer**, element 20, Fig. 1) to a remote node (**to a remote personal computer**, element 49, Fig. 1) of a local network (**of the networked environment**, see Fig. 1) and to describe where to store data received from

the remote node (**and a descriptor to describe the virtual address of the buffer where data is received from a remote location**, see col. 15, lines 46-49) to establish a connection-oriented virtual interface (VI) channel between the first node and the remote node in the local network (**establishing a VI logical connection between the first personal computer and the remote personal computer**, col. 6, lines 47-55, col. 17, lines 32-51),

wherein the remote node comprises a second work queue pair (**remote computer comprises a VI interface of a second pair of send and receive queues**; note that a remote personal computer 49 has similar components as personal computer 20, see col. 6, lines 47-55 and thus remote personal computer 49 has network interface adapters similar to 54 and 54a, Fig. 1 and virtual interfaces similar to 106, Fig. 1, see also col. 7, lines 4-9, and Fig. 6) and wherein the connection-oriented VI channel is established by associating the first work queue pair with the second work queue pair (**VI channel connection is established by having a descriptor posted in the receive queue that includes a virtual address of the buffer where data received from a send queue of a remote location are to be stored** and thus the receive queue of a virtual interface of a local personal computer is associated with the send queue of a virtual interface of a remote personal computer, col. 15, lines 37-53; thus the first work queue pair is associated with the second work queue pair; see also paragraph 0022 of Regneir on how VI connection is established);

a channel adapter (**VIA Network Interface Adapter**, see element 100, Fig. 6) coupled to the first work queue pair (**VIA network Interface Adapter coupled to VI send and receive queues**, see element 106, 107, 108, Fig. 6), the channel adapter (**VIA Network Interface Adapter of the personal computer**, see col. 6, lines 47-55 and Figs. 1 and 6) to interface a host

to a switched fabric (**VIA Network Interface Adapter to interface with a remote router**, see col. 6, lines 47-55 and Fig. 1); and

an emulation driver (**VI kernel agent**, see col. 15, lines 20-36 and Fig. 6) coupled to the channel adapter (**VI kernel agent coupled to VIA Network Interface Adapter**, see Fig. 6), the emulation driver mapping a legacy physical address (**a virtual memory address**) to the local physical address (**a physical memory address**) of the remote node of the local network (**VI kernel agent translates virtual memory address to a physical memory address**, see col. 18, lines 3-7), the channel adapter (**VI Network Interface Adapter**) mapping the local physical address of the remote node to the established connection-oriented VI channel to communicate with the remote node (**recoverable I/O request processor of the VIA Network Interface Adapter translates the physical memory address and sends the buffer data to a remote VIA Network Interface Adapter over a network**, see col. 17, lines 32-51).

Forin does not explicitly show the VI channel connection established between a host node and each of the remote nodes in a network based on local physical addresses of the remote node.

However, Regnier discloses establishing a VI connection from a process in a first computer to a second process in a second computer by determining the destination address of the second computer (**based on the physical address of the second computer**, paragraphs 0021, 0022, 0035, page 4, claim 12, lines 58-67 and page 5, lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the VIA network adapter of Forin with the teaching of Regnier such that the VI channel connection established between a host node and each of the

remote nodes in a network based on local physical addresses of the remote node. The motivation to do so is to use the physical address of the remote node to specify the physical location of the remote node to which data messages are transferred.

Forin discloses mapping the second physical address to the first physical address (see col. 18, lines 3-7) and does not explicitly show the second physical address is embedded within the first physical address.

However, Munoz discloses embedding/encapsulating a first network address in a second network address (col. 2, lines 10-30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the node apparatus of Forin with the teaching of Munoz in discloses embedding/encapsulating a first network address in a second network address such that the second physical address of Forin is embedded within the first physical address.

The motivation to do so is to provide an address interworking system that enables dissemination of high level routing protocol information such as terminal capabilities during communication between a first network using first network addressing and a second network using second network addressing.

Regarding claim 3, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 3 above, except fails to explicitly show the apparatus of claim 1 wherein the legacy physical address comprises a MAC address for use in an existing or legacy network.

However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using Ethernet MAC addressing scheme.

Regarding claim 4, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 3 above, except fails to explicitly show apparatus of claim 1 wherein the legacy physical address comprises a IEEE 802.3 Ethernet MAC address.

However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an IEEE 802.3 Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using the standard IEEE 802.3 Ethernet MAC addressing scheme.

Regarding claim 5, Forin discloses the apparatus of claim 1 and further comprising a protocol stack (elements 102, 111, 110, 100, Fig. 6) coupled to the emulation driver (**coupled to VI kernel agent**, see Fig. 6), the protocol stack implementing a legacy protocol (**the protocol**

stack implements an Ethernet protocol, see col. 14, lines 52-61) and mapping a network address to a legacy physical address for each of a plurality of nodes (**VIA network interface adapter translates virtual memory addresses to physical memory addresses**, see col. 14, lines 61-67).

Regarding claim 6, Forin discloses a node apparatus (personal computer 20, see col. 6, lines 47-55 and Figs. 1 and 6) comprising:

a channel adapter (**a VIA Network Interface Adapter**, see element 100, Fig. 6) to interface a host to a switched fabric (**VIA Network Interface Adapter to interface with a remote router**, see col. 6, lines 47-55 and Fig. 1);

an emulation driver (**VI kernel agent**, see col. 15, lines 20-36 and Fig. 6) coupled to the channel adapter (**VI kernel agent coupled to VIA Network Interface Adapter**, see Fig. 6), the emulation driver mapping a first physical address of a remote node (**a virtual memory address**) to a second physical address (**a physical memory address**) of the remote node (**VI kernel agent translates virtual memory address to a physical memory address**, see col. 18, lines 3-7), the channel adapter (**VI Network Interface Adapter**) mapping the second physical address of the remote node to a channel to communicate with the remote node (**recoverable I/O request processor of the VIA Network Interface Adapter translates the physical memory address and sending the buffer data to a remote VIA Network Interface Adapter over a network**, see col. 17, lines 32-51).

a first virtual interface (VI) work queue pair (**a first pair of send and receive queues in personal computer 20**, see col. 15, lines 37-43, elements 107, 108, Fig. 6) coupled to the host (**a personal computer**, element 20, Fig. 1) to establish a VI channel between the host and the remote node (**remote personal computer**, element 49, Fig. 1) of the local network (**establishing a VI connection between VIA network interface adapter 100 and a remote adapter over a network**, col. 17, lines 32-51 and elements 106, 107, 108, Fig. 6),

wherein the first work queue pair (**a first pair of send and receive queues in personal computer 20**, see col. 15, lines 37-43, elements 107, 108, Fig. 6) comprising descriptors to describe data to be transmitted (**comprising a descriptor to describe the virtual memory address of the buffer to be sent**, co. 15, lines 43-46) from a first node (**from a first personal computer**, element 20, Fig. 1) to a remote node (**to a remote personal computer**, element 49, Fig. 1) of a local network (**of the networked environment**, see Fig. 1) and to describe where to store data received from the remote node (**and a descriptor to describe the virtual address of the buffer where data is received from a remote location**, see col. 15, lines 46-49),

wherein the remote node comprises a second work queue pair (**remote computer comprises a VI interface of a second pair of send and receive queues**; note that a remote personal computer 49 has similar components as personal computer 20, see col. 6, lines 47-55 and thus remote personal computer 49 has network interface adapters similar to 54 and 54a, Fig. 1 and virtual interfaces similar to 106, Fig. 1, see also col. 7, lines 4-9, and Fig. 6).

Forin does not explicitly show the VI channel is established by associating the first work queue pair with the second work queue pair (paragraphs 0020, 0021, 0022).

However, Regnier discloses establishing a VI connection by associating a first send/receive work queue pair of a VI producer with a second send/receive work queue of a VI consumer from a process in a first computer to a second process in a second computer by determining the destination address of the second computer (paragraphs 0020, 0021, 0022, 0035, page 4, claim 12, lines 58-67 and page 5, lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the VIA network adapter of Forin with the teaching of Regnier such that the VI channel connection is established by associating the first work queue pair with the second work queue pair.

The motivation to do so is to improve the performance of distributed applications by reducing the latency associated with critical message passing operations.

Forin discloses mapping the second physical address to the first physical address (see col. 18, lines 3-7) but does not explicitly show the second physical address is embedded within the first physical address.

However, Munoz discloses embedding/encapsulating a first network address in a second network address (col. 2, lines 10-30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the node apparatus of Forin with the teaching of Munoz in discloses embedding/encapsulating a first network address in a second network address such that the second physical address of Forin is embedded within the first physical address.

The motivation to do so is to provide an address interworking system that enables dissemination of high level routing protocol information such as terminal capabilities during communication between a first network using first network addressing and a second network using second network addressing.

Regarding claim 7, Forin discloses the apparatus of claim 6 wherein first physical address comprises a legacy or global physical address (**virtual memory address**), and wherein the second physical address comprises a local physical address (**physical memory address**, see col. 18, lines 3-7).

Regarding claim 8, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 7 above, except fails to explicitly show the apparatus of claim 1 wherein the legacy physical address comprises a MAC address for use in an existing or legacy network.

However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using Ethernet MAC addressing scheme.

Regarding claim 9, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 7 above, except fails to explicitly show apparatus of claim 1 wherein the legacy physical address comprises a IEEE 802.3 Ethernet MAC address.

However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an IEEE 802.3 Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using the standard IEEE 802.3 Ethernet MAC addressing scheme.

Regarding claim 10, Forin discloses the apparatus of claim 7 wherein the local physical address (**physical memory address**) can be used by the node apparatus for communication with other nodes on the local network (see col. 18, lines 3-7).

Regarding claim 12, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 6 above, except fails to explicitly show the apparatus of claim 6 wherein the channel adapter comprises an ATM NIC for interfacing to an ATM network.

However, Regnier discloses a method for providing data movement between endpoints connected by multiple VI channels (see paragraph 0023) and that ATM network can be used as the data network between endpoints (see paragraph 0012).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of connecting a source node and a remote node via an ATM network such that the VIA network interface adapter would be a ATM NIC. The motivation to do is to interface the VI Network Interface Adapter with other networks such as ATM if an ATM network is being used.

Regarding claim 13, Forin discloses the apparatus of claim 6 wherein the channel adapter comprises a host channel adapter (**VIA network interface adapter 100**, see col. 17, lines 40-48 and Fig. 6).

Regarding claims 31, 33, Forin discloses a method of communicating a message over a channel based network comprising:

obtaining a local physical address for a first node of a network (**virtual memory address of a personal computer**, see col. 18, lines 3-7);

obtaining a legacy or global physical address for the first node based on the local physical address of the first node (**physical memory address is obtained from virtual memory address**, see col. 18, lines 3-7);

the work queue pair (**a first pair of send and receive queues in personal computer 20**, see col. 15, lines 37-43, elements 107, 108, Fig. 6) comprises descriptors to describe data to be transmitted (**comprising a descriptor to describe the virtual memory address of the buffer to**

be sent, co. 15, lines 43-46) and to describe when to store received data (**and a descriptor to describe the virtual address of the buffer where data is received from a remote location**, see col. 15, lines 46-49);

generating a message to be sent to the second node (**sending data to a remote node**, col. 9, lines 39-56), the second node including a

global or legacy physical address (**the second personal computer is similar to the first personal computer and is comprised of physical memory address**, col. 6, lines 47-55);

mapping the global physical address of the second node (**physical memory address**) to a local physical address of the second node (**is mapped to virtual memory address**, col. 9, lines 18-38);

mapping the local physical address of the second node to the VI channel established between the first and second nodes (**virtual memory address of the descriptor is mapped to the VI send queue**, col. 15, lines 37-49);

sending the message to the second node over the established VI channel (**sending data to the remote node over the VI send queue**, col. 15, lines 37-53).

Forin does not explicitly show obtaining a local physical address for one or more other nodes in the network and establishing a connection-oriented virtual interface (VI) channel between the first node and each of the one or more other nodes in the network based on local physical addresses of the other nodes using a work queue pair.

However, Regnier discloses establishing a VI connection from a process in a first computer to a second process in a second computer by determining the destination address of the

second computer (**based on the physical address of the second computer**, paragraphs 0021, 0022, 0035, page 4, claim 12, lines 58-67 and page 5, lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the VIA network adapter of Forin with the teaching of Regnier such that the VI channel connection established between a host node and each of the remote nodes in a network based on local physical addresses of the remote node using the send and receive queue of the VI channel. The motivation to do so is to use the physical address of the remote node to specify the physical location of the remote node to which data messages are transferred.

Forin discloses mapping the second physical address to the first physical address (see col. 18, lines 3-7) and does not explicitly show the local physical address is embedded in the global physical address of the second node.

However, Munoz discloses embedding/encapsulating a first network address in a second network address (col. 2, lines 10-30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the node apparatus of Forin with the teaching of Munoz in discloses embedding/encapsulating a first network address in a second network address such that the local physical address of Forin is embedded in the global physical address of the second node.

The motivation to do so is to provide an address interworking system that enables dissemination of high level routing protocol information such as terminal capabilities during

communication between a first network using first network addressing and a second network using second network addressing.

3. Claims 14, 17-23, 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forin et al. (USP 6,321,276) in view of Regnier and Nguyen et al. (US Publication 2002/0016926), and in further view of Munoz et al. (USP 6,741,585).

Regarding claims 14, 20, Forin discloses a method comprising:

the connection-oriented VI channel is established by using a first work queue pair at the first node and multiple work queue pairs at each of the multiple other nodes, and associating the first work queue pair with each of the multiple other work queue pairs (**VI channel connection is established by having a descriptor posted in the receive queue of a host that includes a virtual address of the buffer where data received from a send queue of a remote location are to be stored** and thus the receive queue of a virtual interface of a local personal computer is associated with the send queue of a virtual interface of a remote personal computer, col. 15, lines 37-53; thus the first work queue pair is associated with the second work queue pair; see also paragraph 0022 of Regneir on how VI connection is established);

wherein the first work queue pair (**a first pair of send and receive queues in personal computer 20**, see col. 15, lines 37-43, elements 107, 108, Fig. 6) comprising descriptors to describe data to be transmitted (**comprising a descriptor to describe the virtual memory address of the buffer to be sent**, co. 15, lines 43-46) from a first node (**from a first personal computer**, element 20, Fig. 1) and to describe where to store data received (**and a descriptor to**

describe the virtual address of the buffer where data is received from a remote location, see col. 15, lines 46-49),

Forin determines a first physical address (**virtual memory address**) to a second physical address (**physical memory address**) correspondence for the node in the network.

Forin does not explicitly show the connection-oriented VI channel connection is established between a host node and each of the other nodes based on local physical addresses of the other nodes.

However, Regnier discloses establishing a VI connection from a process in a first computer to a second process in a second computer based on the physical address of the second computer (paragraphs 0021, 0022, 0035, page 4, claim 12, lines 58-67 and page 5, lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the VIA network adapter of Forin with the teaching of Regnier such that the connection-oriented VI channel is established between a first node and each of multiple other nodes based on the physical address of the other nodes. The motivation to do so is to use the physical address of the remote node to specify the physical location of the remote node to which data messages are transferred.

The combination method of Forin and Regneir does not explicitly show determining a first physical address to a network address correspondence for a node of the network using a single address resolution protocol (ARP).

However, Nguyen discloses using ARP to correlate IP addresses to physical hardware addresses (paragraph 0029).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the VI channel connection method of Forin and Regneir with the teaching of Nguyen in employing ARP protocol such that VI channel connection method of Forin and Regneir will determine a first physical address to a network address correspondence for a node of the network using a single ARP protocol over the network. The motivation to do so is to resolve IP address an IP packet to the physical address of the destination node in order for the IP packet to be sent from the source node to the destination node.

Forin discloses mapping the second physical address to the first physical address (see col. 18, lines 3-7) and does not explicitly show the local physical address is embedded within the global or legacy address of the node.

However, Munoz discloses embedding/encapsulating a first network address in a second network address (col. 2, lines 10-30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the node apparatus of Forin with the teaching of Munoz in discloses embedding/encapsulating a first network address in a second network address such that the local physical address is embedded within the global or legacy address of the node

The motivation to do so is to provide an address interworking system that enables dissemination of high level routing protocol information such as terminal capabilities during communication between a first network using first network addressing and a second network using second network addressing.

Regarding claim 17, Forin discloses the apparatus of claim 6 wherein first physical address comprises a legacy or global physical address (**virtual memory address**), and wherein the second physical address comprises a local physical address (**physical memory address**, see col. 18, lines 3-7).

Regarding claim 18, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 17 above, except fails to explicitly show the apparatus of claim 17 wherein the legacy physical address comprises a MAC address for use in an existing or legacy network.

However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using Ethernet MAC addressing scheme.

Regarding claim 19, Forin discloses all the aspects of the claimed invention set forth in the rejection of claim 17 above, except fails to explicitly show apparatus of claim 17 wherein the legacy physical address comprises a IEEE 802.3 Ethernet MAC address.

However, Forin discloses that the VIA network interface adapter can be an Ethernet card (see col. 14, lines 52-61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of processing I/O requests in Forin with the teaching of using an Ethernet card for the VIA Network Interface Adapter in Forin such that the virtual memory address comprises an IEEE 802.3 Ethernet MAC address. The motivation to do so is to provide high-speed data communications between a host and a remote router on an Ethernet network using the standard IEEE 802.3 Ethernet MAC addressing scheme.

Regarding claim 21, Forin discloses a method comprising:

obtaining a local physical address for a first node of a network (**virtual memory address of a personal computer**);

obtaining a legacy or global physical address for the first node based on the local physical address of the first node (**physical memory address is obtained from virtual memory address**, see col. 18, lines 3-7);

the work queue pair (**a first pair of send and receive queues in personal computer 20**, see col. 15, lines 37-43, elements 107, 108, Fig. 6) comprises descriptors to describe data to be transmitted (**comprising a descriptor to describe the virtual memory address of the buffer to be sent**, co. 15, lines 43-46) and to describe when to store received data (**and a descriptor to describe the virtual address of the buffer where data is received from a remote location**, see col. 15, lines 46-49);

Forin does not explicitly show obtaining a local physical address for one or more other nodes in the network and establishing a connection-oriented virtual interface (VI) channel

between the first node and each of the one or more other nodes in the network based on local physical addresses of the other nodes using a work queue pair.

However, Regnier discloses establishing a VI connection from a process in a first computer to a second process in a second computer by determining the destination address of the second computer (**based on the physical address of the second computer**, paragraphs 0021, 0022, 0035, page 4, claim 12, lines 58-67 and page 5, lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the VIA network adapter of Forin with the teaching of Regnier such that the VI channel connection established between a host node and each of the remote nodes in a network based on local physical addresses of the remote node using the send and receive queue of the VI channel. The motivation to do so is to use the physical address of the remote node to specify the physical location of the remote node to which data messages are transferred.

The combined method of Forin and Regneir does not explicitly show using a legacy protocol to broadcast a request message over each of the established VI channels to obtain a network address of the first node.

However, Nguyen discloses broadcasting address resolution protocol ARP over established virtual tunnels to obtain the IP address of a destination node (paragraphs 0029, 0036, 0038, 0094, 0101).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of combined method of Forin and Regneir of establishing VI channels with the teaching of Nguyen in using ARP broadcasts to

obtain IP address of a destination node such that the combined method of Forin and Regneir will employ using a ARP/legacy protocol to broadcast a request message over each of the established VI channels to obtain a network address of the first node.

The motivation to do so is to utilize the VI channel architecture to reduce the latency associated with broadcasting ARP requests because VI channel allows data transfer between the buffers of a VI consumer and the network without copying data to and from intermediate operating system buffer memory.

Forin discloses mapping the second physical address to the first physical address (see col. 18, lines 3-7) and does not explicitly show the local physical address of each node is embedded within the global or legacy address of the node.

However, Munoz discloses embedding/encapsulating a first network address in a second network address (col. 2, lines 10-30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the node apparatus of Forin with the teaching of Munoz in discloses embedding/encapsulating a first network address in a second network address such that the local physical address of each node is embedded within the global or legacy address of the node.

The motivation to do so is to provide an address interworking system that enables dissemination of high level routing protocol information such as terminal capabilities during communication between a first network using first network addressing and a second network using second network addressing.

Regarding claim 22, the combined method of Forin, Regneir and Nguyen discloses all the aspects of the claimed invention set forth in the rejection of claim 21 above, Forin further discloses the method of claim 21 further comprising:

determining the local physical address based on the global address of the selected one of the other nodes (**VI kernel agent of personal computer 49 translates virtual memory address to a physical memory address**, see col. 18, lines 3-7 and Fig. 1; note that personal computers 20 and 49 are similar).

Nguyen also discloses using the legacy protocol (**using ARP protocol**, paragraph 0029) to obtain a global physical address (**to obtain hardware address of the destination node**) corresponding to a network address of a selected one of the other nodes (**based on the IP address of the destination node**, paragraph 0029);

Regarding claim 23, Nguyen discloses the method of claim 21 wherein the network address comprises an IP address (**IP address of a destination node is obtained**, paragraph 0029).

Regarding claims 25-26, Forin does not explicitly show the method of claim 21 wherein the establishing a connection-oriented VI channel comprises establishing a one-to-many work queue bindings and a many-to-many work queue bindings between the first node and the one or more other nodes in the network.

However, Forin discloses one or more virtual interfaces managed by the VI kernel agent a VIA network adapter and each virtual interface comprises a send queue and a receive queue (col. 15, lines 19-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of combined method of Forin, Regneir and Nguyen with the teaching of Forin in employing multiple send and receive queues at the VIA network adapter such that VI channel comprises establishing a one-to-many work queue bindings and a many-to-many work queue bindings between the first node and the one or more other nodes in the network.

The motivation to do so is to allow multiple communication interfaces for multiple I/O operations between an application and the VIA network adapter.

4. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forin et al. (USP 6,321,276) in view of Nguyen et al. (US Publication 2002/0016926), and in further view of Munoz et al. (USP 6,741,585).

Regarding claim 27, Forin discloses a method comprising:

establishing a virtual interface (VI) channel between a first node and each of a plurality of other nodes in the network using a work queue pair (**VI channel connection is established by having a descriptor posted in the receive queue of a host that includes a virtual address of the buffer where data received from a send queue of a remote location are to be stored** and thus the receive queue of a virtual interface of a local personal computer is associated with the send queue of a virtual interface of a remote personal computer, col. 15, lines

37-53; see also paragraph 0022 of Regneir on how VI connection is established), wherein the work queue pair (**a first pair of send and receive queues in personal computer 20**, see col. 15, lines 37-43, elements 107, 108, Fig. 6) comprises descriptors to describe data to be transmitted (**comprising a descriptor to describe the virtual memory address of the buffer to be sent**, co. 15, lines 43-46) and to describe when to store received data (**and a descriptor to describe the virtual address of the buffer where data is received from a remote location**, see col. 15, lines 46-49);

determining a local physical address corresponding to the legacy physical address based on the legacy physical address without use of a specialized address request protocol (**physical memory address is obtained from virtual memory address without using a specialized address request protocol**, see col. 18, lines 3-7).

Forin does not explicitly show using a legacy protocol to broadcast a request message over the VI channels including a network address; and receiving a response message including a global or legacy physical address corresponding to the network address.

However, Nguyen discloses broadcasting address resolution protocol ARP over established virtual tunnels to obtain a hardware address corresponding to the IP address of a destination node in an ARP reply (paragraphs 0029, 0036, 0038, 0094, 0101).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of combined method of Forin and Regneir of establishing VI channels with the teaching of using ARP broadcasts to obtain IP address of a destination node such that the combined method of Forin and Regneir will

employ using a ARP/legacy protocol to broadcast a request message over each of the established VI channels to obtain a network address of the first node.

The motivation to do so is to utilize the VI channel architecture to reduce the latency associated with broadcasting ARP requests because VI channel allows data transfer between the buffers of a VI consumer and the network without copying data to and from intermediate operating system buffer memory.

Forin discloses mapping the second physical address to the first physical address (see col. 18, lines 3-7) and does not explicitly show the local physical address is embedded within the global or legacy address of the node.

However, Munoz discloses embedding/encapsulating a first network address in a second network address (col. 2, lines 10-30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the node apparatus of Forin with the teaching of Munoz in discloses embedding/encapsulating a first network address in a second network address such that the local physical address is embedded within the global or legacy address of the node

The motivation to do so is to provide an address interworking system that enables dissemination of high level routing protocol information such as terminal capabilities during communication between a first network using first network addressing and a second network using second network addressing.

Regarding claims 28-29, Forin does not explicitly show the method of claim 27 wherein the establishing a connection-oriented VI channel comprises establishing a one-to-many work queue bindings and a many-to-many work queue bindings between the first node and the one or more other nodes in the network.

However, Forin discloses one or more virtual interfaces managed by the VI kernel agent a VIA network adapter and each virtual interface comprises a send queue and a receive queue (col. 15, lines 19-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system and method of combined method of Forin and Nguyen with the teaching of Forin in employing multiple send and receive queues at the VIA network adapter such that VI channel comprises establishing a one-to-many work queue bindings and a many-to-many work queue bindings between the first node and the one or more other nodes in the network.

The motivation to do so is to allow multiple communication interfaces for multiple I/O operations between an application and the VIA network adapter.

Response to Arguments

5. Applicant's Remarks/Arguments filed on 1/29/2008 with respect to claims 1, 3-10, 12-14, 17-23, 25-29, 31, 33 have been considered but are not persuasive.

In response to applicant's arguments on page 4, paragraph 1 and 2 of the Remarks regarding claim 6 that the Forin reference fails to teach or suggest "the connection oriented VI channel is established by associating the first work queue pair with the second work queue pair," examiner respectfully disagrees. It is noted that virtual interface 106 (Fig. 6 and col. 15, lines 37-43) of a first node/personal computer 20 (Fig. 1), comprises a send queue and a receive queue. Then the virtual interface 106 of the first node sends the buffer over a network to a remote VIA network adapter of a remote node such as personal computer 49 in Fig. 1, and thereby a VI logical connection/channel is established between a first node and a remote node (col. 17, lines 43-48). As also explained in the rejection of claim 1 above, **VI channel connection is established by having a descriptor posted in the receive queue that includes a virtual address of the buffer where data received from a send queue of a remote location are to be stored** and thus the receive queue of a virtual interface of a local personal computer is associated with the send queue of a virtual interface of a remote personal computer (col. 15, lines 37-53) and thus the first work queue pair is associated with the second work queue pair (see also paragraph 0022 of Regneir on how VI connection is established).

In response to applicant's arguments on page 4, last paragraph and page 6, paragraph 1 of the Remarks that Forin reference, whether taken alone or in combination with Munoz, fails to teach or suggest "the first physical address is embedded within the second physical address," examiner respectfully disagrees. It is noted that Munoz teaches performing

encapsulation/embedding of the first destination address into a first network-encapsulated second network destination address (col. 2, lines 10-30), which indicates the first destination address is encapsulated/embedded within the second destination address. It is further noted that the gateways of Munoz discloses the first capability of performing address encapsulation in addition to the optional capability of performing address mapping for communication request between the first network and the second network. Thus, Munoz teaches "the local physical address of the remote node is embedded/encapsulated/provided within the legacy physical address of the remote node." As address encapsulation/embedding of a first network address into a second network address by the gateway is clearly taught by Munoz, altering the form of a first network address to a second network via address mapping is just another optional addressing scheme that is capable to be performed by the gateway.

In addition, applicant also argued on page 1, paragraphs 2-3 and page 2, paragraphs 1-2 of the Remarks that that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to do so is to provide an address interworking system that enables dissemination of high level routing protocol information such as terminal capabilities during communication between a first network using first network addressing and a second network using second network addressing.

In light of the foregoing reasons, Claims 1, 3-10, 12-13, 31, 33 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Forin et al. (USP 6,321,276) in view of Regnier et al. (US Publication 2002/0062402), and in further view of Munoz et al. (USP 6,741,585), Claims 14, 17-23, 25-26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Forin et al. (USP 6,321,276) in view of Regnier and Nguyen et al. (US Publication 2002/0016926), and in further view of Munoz et al. (USP 6,741,585), and Claims 27-29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Forin et al. (USP 6,321,276) in view of Nguyen et al. (US Publication 2002/0016926), and in further view of Munoz et al. (USP 6,741,585).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Mew /K. M./
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/Chi H Pham/

Supervisory Patent Examiner, Art Unit 2616

4/11/08